

CLAIMS

What is claimed:

- 1 1. A wafer comprising:
  - 2 a layer of solid diamond; and
  - 3 a plurality of integrated circuits formed on the layer of solid diamond.
- 1 2. The wafer of claim 1 wherein the layer of solid diamond is at least 200 mm wide.
- 1 3. The wafer of claim 1 further comprising:
  - 2 a layer of monocrystalline semiconductor material on the layer of solid
  - 3 diamond, the integrated circuits being formed on the layer of monocrystalline
  - 4 semiconductor material.
- 1 4. The wafer of claim 3 wherein the layer of monocrystalline semiconductor material is at least 200 mm wide.
- 1 5. The wafer of claim 3 wherein the layer of monocrystalline semiconductor material is a layer of monocrystalline silicon.

1 6. The wafer of claim 5 further comprising:  
2 a layer of polysilicon on the layer of monocrystalline semiconductor  
3 material, the layer of monocrystalline silicon being located on the layer of  
4 polysilicon.

1 7. The wafer of claim 1 further comprising:  
2 a plurality of contacts on the integrated circuit.

1 8. A wafer comprising:  
2 a layer of solid diamond; and  
3 a layer of monocrystalline semiconductor material on the layer of solid  
4 diamond.

1 9. The wafer of claim 8 wherein the layer of solid diamond is at least 200 mm  
2 wide.

1 10. The wafer of claim 9 wherein the layer of monocrystalline semiconductor  
2 material is at least 200 mm wide.

1 11. The wafer of claim 10 wherein the layer of monocrystalline semiconductor

2 material is a layer of monocrystalline silicon.

1 12. A singulated die comprising:

2 a layer of solid diamond; and

3 an integrated circuit formed on the layer of solid diamond.

1 13. The singulated die of claim 12 further comprising:

2 a layer of monocrystalline semiconductor material on the layer of solid

3 diamond, the integrated circuit being formed on the layer of monocrystalline

4 semiconductor material.

1 14. The singulated die of claim 13 wherein the layer of monocrystalline

2 semiconductor material is a layer of monocrystalline silicon.

1 15. The singulated die of claim 14 further comprising:

2 a layer of polysilicon on the layer of monocrystalline silicon, the layer of

3 monocrystalline silicon being located on the layer of polysilicon.

1 16. The singulated die of claim 12 further comprising:

2 a plurality of contacts on the integrated circuit.

1 17. The singulated die of claim 11 wherein the die has a rectangular outline  
2 when viewed from above.

1 18. An electronic assembly comprising:  
2 a package substrate; and  
3 a die mounted on the package substrate, the die including a layer of solid  
4 diamond and an integrated circuit formed on the layer of solid diamond.

1 19. The electronic assembly of claim 18 wherein the die includes a plurality of  
2 contacts on the integrated circuit and is located on top of the package substrate  
3 with the contacts at the bottom of the die.

1 20. The electronic assembly of claim 18 wherein the die includes a layer of  
2 monocrystalline semiconductor material on the layer of solid diamond, the  
3 integrated circuits being formed on the layer of monocrystalline semiconductor  
4 material.

1 21. The electronic assembly of claim 20 wherein the layer of monocrystalline  
2 semiconductor material is a layer of monocrystalline silicon.

1 22. The electronic assembly of claim 21 wherein a layer of polysilicon on the

2       layer of monocrystalline silicon, the layer of monocrystalline silicon being  
3       located on the layer of polysilicon.

1       23.      The electronic assembly of claim 18 wherein the die includes a plurality of  
2       contacts on the integrated circuit.

1       24.      The electronic assembly of claim 23 wherein a surface of the layer of solid  
2       diamond opposing the package substrate is exposed.

1       25.      An electronic device comprising:  
2                a layer of solid diamond; and  
3                an integrated circuit formed on the layer of solid diamond.

1       26.      The electronic device of claim 25 further comprising:  
2                a layer of monocrystalline semiconductor material between the layer of  
3        diamond and the integrated circuit.

1       27.      The electronic device of claim 26 wherein a layer of monocrystalline  
2        semiconductor material is a layer of polysilicon.

1       28.      A method of making a plurality of dice comprising:

2 forming a layer of solid diamond and a layer of monocrystalline  
3 semiconductor material on one another;  
4 manufacturing a plurality of integrated circuits on the layer of  
5 monocrystalline semiconductor material; and  
6 severing the layer of solid diamond between the integrated circuits.

1 29. The method of claim 28 further comprising:  
2 implanting ions into a surface of a wafer of monocrystalline  
3 semiconductor material, the layer of solid diamond thereafter being located over  
4 the surface of the monocrystalline wafer; and  
5 shearing a portion of the monocrystalline wafer not implanted with the  
6 ions from a portion of the monocrystalline wafer implanted with the ions, the  
7 portion of the monocrystalline wafer implanted with the ions forming the layer  
8 of monocrystalline semiconductor material.

1 30. The method of claim 28 further comprising:  
2 forming a support layer with the layer of solid diamond between the  
3 support layer and the layer of monocrystalline semiconductor material; and  
4 severing the support layer so that respective portions thereof form part of  
5 respective ones of the dice.